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SPIDER MITES

The first thought most people have about spider mites probably relates to damage inflicted to a favorite plant by tiny creatures they could hardly see. Spider mites are pests of over 180 plant species. They are considered the number one pest of ornamental plants in the S.E. United States. Spider mites are neither spiders nor insects, yet they spin webs similar to spiders. The bodies of spider mites are small with no distinct segments. Spider mites usually have eight-legs as adults. Their mouthparts (chelicerae) are designed specifically for puncturing the epidermal cells of host plants. Members of the spider mite family (Tetranychidae) quickly populate their hosts, and some spin visible webs on which they walk and lay eggs. The webs are especially visible when population densities are high.

Twospotted spider mite feeding damage. Photo: Clemson University - USDA Cooperative Extension Slide Series,

The most common spider mite is the two spotted spider mite, *Tetranychus urticae*, which is found on numerous host plants. Other common spider mites include the southern red mite, *Oligonychus ilicis*, which feeds on spruce, azalea, camellia, and related plants; the spruce spider mite, *Oligonychus ununguis*, the major mite pest of conifers worldwide; and the European red mite, *Panonychus ulmi*, a pest on many fruit trees, grapes, and roses. The clover mite, *Bryobia praetiosa*, feeds on a number of herbaceous plants and turfgrasses; the boxwood mite, *Eurytetranychus buxi*, is found primarily on boxwoods.

Twospotted spider mite male and eggs on a leaf.
Photo: Rayanne Lehman, Pennsylvania Department of Agriculture
http://www.ipmimages.org

The two spotted spider mite female is typically larger than the male and has a rounded posterior. The slightly smaller male appears to have longer legs, and his posterior is more pointed. The male typically moves around faster than the female.

In winter, females enter a resting stage and overwinter wherever they can find protection in the soil, crevices, or ground litter. With the start of warmer weather, females become active and begin laying eggs on host plants. In greenhouses, females do not enter a resting stage, so mite populations are continuous throughout the year. Females lay up to six eggs in a day and average one-hundred eggs in a lifetime. Eggs hatch in about eight days at 50ºF , and require only three days at 75ºF. Spider mites go through three developmental stages between egg and adult, larva (six-legged), protonymph, and deutonymph. During each molt, the mite attaches itself to the surface of the plant and forms a chrysalis.

A spider mite damaged leaf (top) and healthy leaf (bottom). Photo: Clyde S. Gorsuch

The first obvious sign of spider mite infestation is stippling on the upper surfaces of the leaves. This looks like the leaves have been pierced with many tiny needles. The stippling occurs when spider mites pierce individual cells of a leaf with their chelicerae (needle-like mouthparts), releasing the cell's cytoplasm. A heavy infestation of spider mites can reduce photosynthesis, cause leaves to fall off, and eventually cause the death of the plant. Large amounts of webbing around the terminal ends of upright branches is a sure sign of heavy spider mite infestation . A possible reason for webbing being attached to the terminals of plants is because this is the area where humidity is lowest. The webbing is spun everywhere the spider mites go. Individual silk strands can be seen on the underside of leaves with the aid of a magnifier.

Detection of spider mites for making treatment decisions can be accomplished by viewing the underside of leaves using at least a 10x lens. Another detection method is to beat leaves and stems over a white piece of paper. Dislodged spider mites can be seen as little "specks" running around on the paper. The size of the spider mite "specks" on the paper is about the same size as the period at the end of this sentence.

Cultural controls for some spider mite species can be attained by maintaining an environment that is high in humidity and low in temperature. High humidity encourages pathogenic fungi that attack the mites, and low temperature slows reproductive rates. A high pressure spray of water directed to the undersides of leaves will wash the spider mites off. This needs to be done about every three days to be effective.

Spider mite webbing on juniper. Photo: Clyde S. Gorsuch

Encouragement of natural enemies such as lady beetles, predatory thrips, and predatory mites (Phytoseiidae) is helpful in suppression of mite populations. Natural enemies may be encouraged by keeping plants healthy, by choosing pesticides specific for mites and by spraying only when the pest population density has reached an economic or aesthetic threshold. Most broad-spectrum chemical insecticides kill the beneficial insects and mites, and thus induce an increase in the spider mite population.

Chemical control is usually needed at some point. Spraying with a labeled miticide kills only the nymphs and adults; the eggs are unaffected by most miticides. Therefore, two treatments should normally be applied at an interval of approximately one week. Mite suppression can be obtained with horticultural oils and insecticidal soaps. These materials have no residual activity and must come in direct contact with the mites. However, they both will kill the egg stage. Sulfur will provide suppression of mites. Traditional miticides often contain the active ingredient hexakis.

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Prepared by David W. Boyd, Graduate Research Assistant and Clyde S. Gorsuch, Extension Entomologist/Professor, Department of Entomology, Soils, and Plant Sciences, Clemson University.

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